

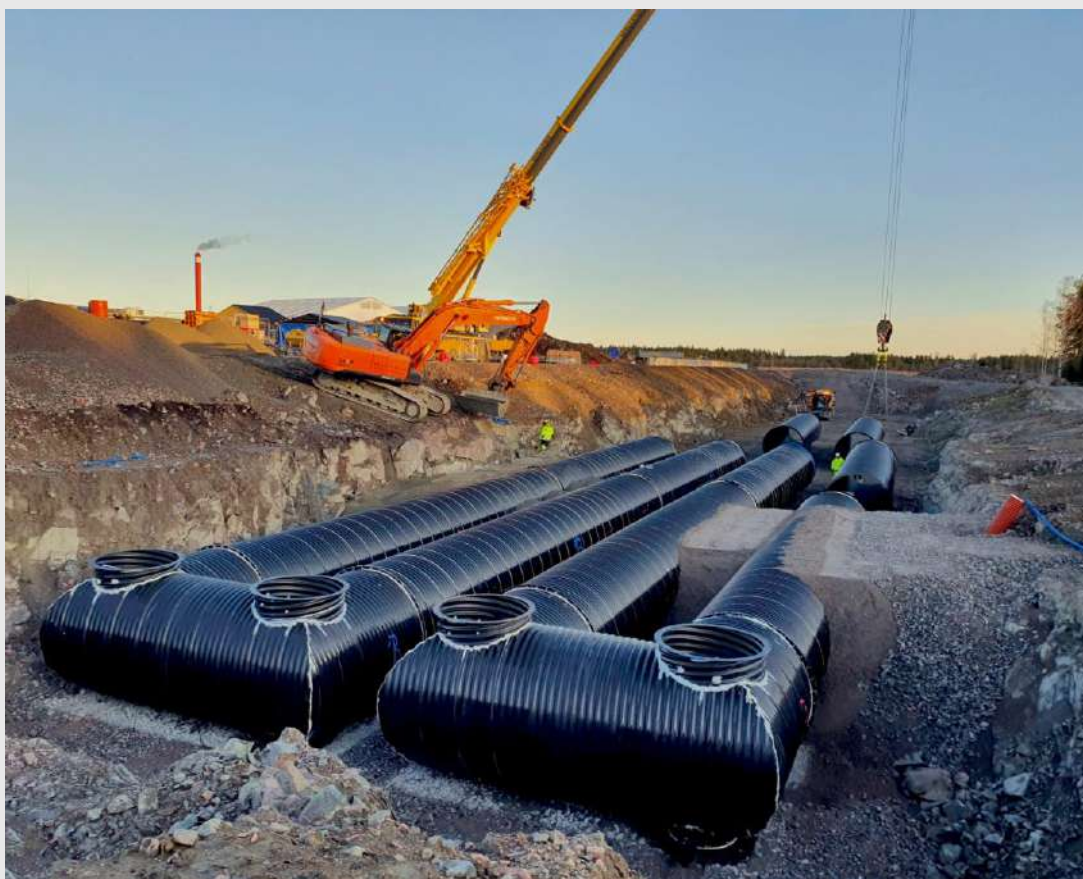
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Steel HelCor® pipes and ViaCon Stormwater Solutions

Type III Environmental Product Declaration No. EPD-P 03.06.2025



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**Basic information**

This declaration is the Type III Environmental Product Declaration (EPD) based on EN 15804+A2 and verified according to ISO 14025 by an external auditor. It contains the information on the impacts of the declared construction materials on the environment and their aspects verified by the independent body according to ISO 14025. Basically, comparison or evaluation of EPD data is possible only if all the compared data were created according to EN 15804+A2.

Life cycle analysis (LCA): A1-A3, C1-C4 and D modules in accordance with EN 15804 (Cradle-to-Gate with options) The year of preparing the EPD: 2024

Product standards: EN 1090-1

Service Life: 40 - 120 years.

PCR: EN 15804 + 2 serves as core PCR

Declared unit: 1 ton.

Reasons for performing LCA: B2B

Representativeness: Sweden, Europe

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Manufacturer

ViaCon AB, a subsidiary of the ViaCon Group, a leading European provider of innovative infrastructure solutions that specializes in designing, producing, and installing steel structures and flexible infrastructure systems in Sweden and the Nordic region. The company offers innovative, durable, cost-efficient, and environmentally sustainable solutions, including corrugated steel structures, geosynthetics, and soil stabilization systems.

The manufacturing plant is in Lycksele, Västerbotten, Sweden (Figure 1).



Figure 1 The view of ViaCon Sweden manufacturing plant located in Lycksele

Distinguished by advanced manufacturing capabilities and an experienced in-house engineering team, ViaCon AB delivers customized solutions tailored to client needs. Its certifications, including EN 1090 Factory Production Control and ISO 9001:2015 Quality Management ensure high standards in its operations.

Serving both public and private sectors, ViaCon AB has completed numerous projects, from large-scale bridges to complex drainage systems. With the resources and expertise of the ViaCon Group, it is a trusted partner in creating modern, sustainable infrastructure across Sweden and the Nordic region.

Products description

ViaCon HelCor® pipes

Steel HelCor® pipes are helically corrugated steel products made of S250GD – S350GD steel grade. Complete system of helically corrugated pipes includes bulkheads, elbows or T-

connections and additional elements such as manholes, inspection chambers etc. According to the European Standard EN 1991- 2 HelCor® pipes can be used as engineering structures for every class of road and railway (up to V=200km/h).

HelCor® pipes have Technical Approval issued by Polish Road and Bridge Research Institute (IBDiM). They have been approved for use in Scandinavia, The Baltic States, Switzerland, Hungary, Slovakia, The Czech Republic, Romania, Austria, The Ukraine, and other European countries.

Steel used to produce the pipes, as well as coupling bands conform to the European Standards of EN 10327 “Continuously hot-dip coated strip and sheet of low carbon steels for cold forming – Technical delivery conditions” and EN 10326 “Continuously hot-dip coated strip and sheet of structural steels - Technical delivery conditions”. Steel is delivered in coils, with a protective coating: 600 g/m² zinc coating both sides, equivalent to 42 µm on each side, 1000 g/m² zinc coating both sides, equivalent to 70µm on each side, 600 g/m² zinc coating both sides, equivalent to 42µm on each side, with an additional 250µm polymer film on one or both sides.

The standard lengths of the HelCor® pipes are 3 m up to 22 m, however the production process allows the manufacturing of any length of pipe.

ViaCon StormWater Solutions

ViaCon StormWater Solutions are made of spiral corrugated pipes HelCor®. Pipes and connections are watertight and protected against corrosion by hot dip galvanization and optional additional polymer coating. Tanks are designed for rainwater and sewage store in range of pH = 3 – 12. The system demands less space and is more economical than other classic solutions. Diameters up to 3,6m and high capacity in a wide range of cover depth make the system perfect for solving the problem of rainwater disposal in high developed areas. The specification of the steel pipes and retention tanks manufactured by ViaCon AB is listed in Table 1.

Table 1. The specification of the steel pipes and retention tanks manufactured by ViaCon AB.

Product	Dimension	Steel grade	Properties
HelCor® Pipes	D300mm- D3600mm	S250GD – S350GD DX51D Galvanized or Galvanized & Coated	mainly in civil engineering as steel-soil composite structures bearing rail and road traffic loads
ViaCon Stormwater Solutions	D300mm- D3600mm	S250GD – S350GD DX51D Galvanized or Galvanized & Coated	Retention tanks, infiltration tanks, firewater tanks, drinking water tanks, perforated tanks, sand and oil separators

Dimensional tolerance: acc.to EN 1090-2, weldability: acc.to EN 10025-2, durability: surface preparation acc.to EN 1090-2, galvanizing acc.to EN 1461, EN 10346, surface coating: acc.to EN 12944-5, EN 10169, producing class till EXC3 acc.to EN-1090-2. More specific information (on products) is available on the producer website: viacon@viacon.se.

Product material declaration

The products are primarily composed of structural galvanized steel (grades S250GD – S350GD, DX51D), which constitutes the main material component. The steel is formed, corrugated, and welded to produce the final structure. The manufacturing process also involves the use of welding wire, and for product variants with additional protective coating the paint coatings are applied.

Substances, REACH – Very high concern

The products do not contain any REACH SVHC substances in amounts greater than 0.1% (1000 ppm).

Product life cycle

Raw material acquisition transportation (A1, A2)

Modules A1 and A2 cover the extraction, processing, and delivery of raw materials, primarily galvanized steel, to the production facility. Steel is supplied mainly in coils with varying zinc coatings. Steel coils together with other galvanized steel products—such as sheets, tubes, profiles, plates, nuts, bolts, and flanges—serve as the primary semi-finished inputs for the manufacturing of ViaCon's pipes and tanks.

Additional ancillary materials include protective coatings (paint), and welding supplies (welding wire and gases such as acetylene, oxygen, and CO₂). Materials are sourced from both domestic and EU suppliers. Transportation, covered under Module A2, involves truck transport and relies on Swedish and European average fuel consumption data.

Manufacturing (A3)

The pipe production process begins with the receipt of raw materials, where galvanized steel sheets undergo quality control inspections to ensure they meet the required specifications. Next, the sheets proceed to the corrugating and forming stage, where specialized machinery transforms them into corrugated steel sheets. These corrugated sheets are then carefully formed into cylindrical or spiral shapes, and precise seams are created to join the individual sections.

For HelCor® pipes, the process continues with profile forming. The cylindrical structures are shaped into either circular profile from diameter on 300mm up to 3600mm.

The ViaCon StormWater Solutions production line starts with the receipt of bottom plates, bulkheads, and ancillary components. These components, along with the previously produced corrugated HelCor® pipes, serve as core elements of the tanks. After quality checks, they move to the assembly and joining stage, where skilled technicians install the bottom plates and bulkheads. The tank segments are bolted together, and critical sections are welded to ensure structural integrity.

Both production paths converge at the painting stage, where protective coatings are applied to enhance durability and longevity. The final step involves quality control, during which each product undergoes thorough inspection and structural integrity testing. This ensures that every pipe and tank meet ViaCon's stringent quality standards and customer requirements before leaving the facility.

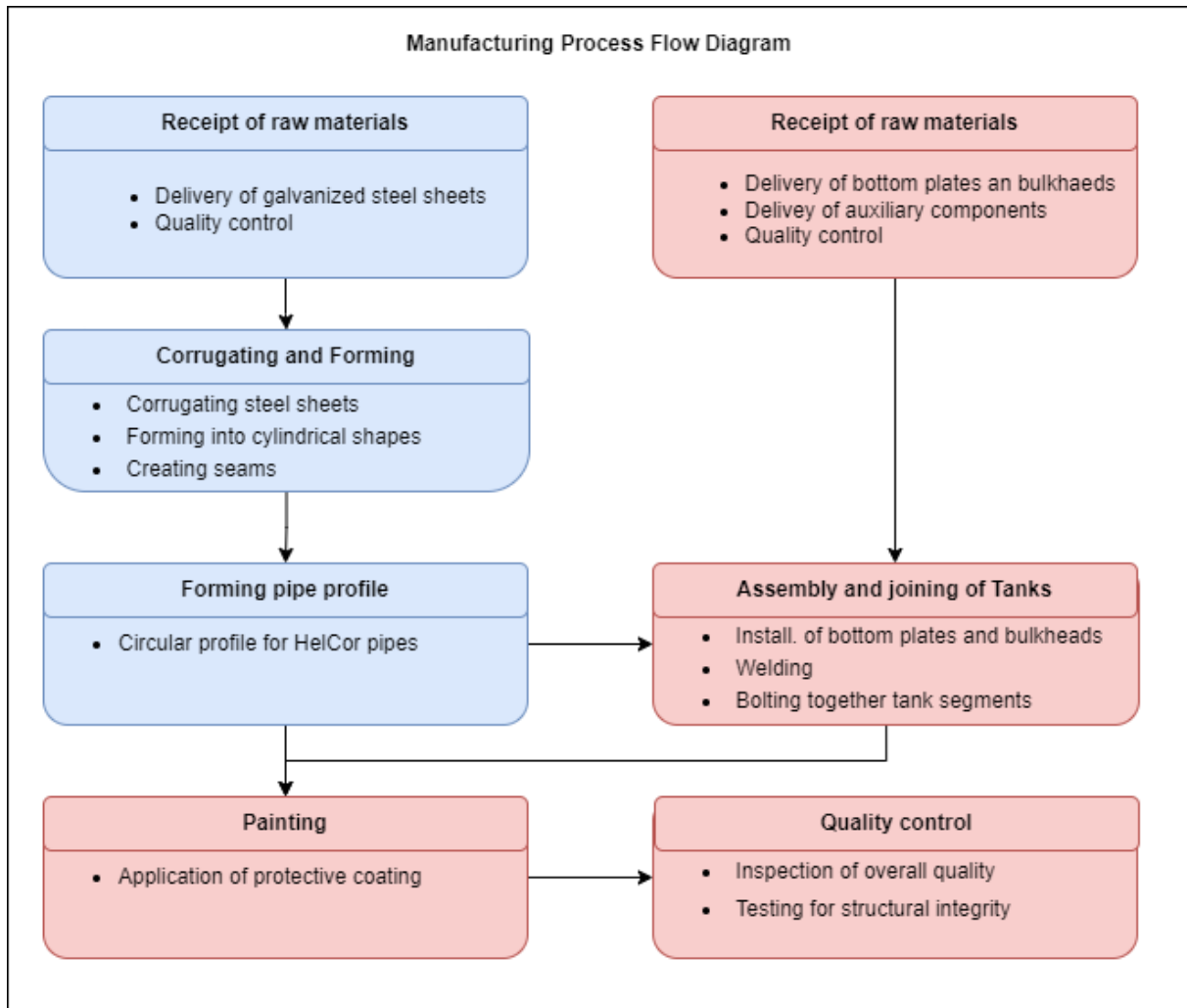


Figure 1 – Diagram of the manufacturing process

End of life (C1, C2, C3, C4, D)

Accurately modeling the impacts of the deconstruction phase (module C1) is challenging, but estimates were made using existing literature on energy consumption during typical demolition processes. In the assumed end-of-life scenario, the dismantled steel pipes and retention tanks are transported 70 km to a waste processing facility using a >16t EURO 5 lorry, where they are shredded. Module D accounts for the credits from recycling 100% of the primary steel scrap, calculated using the net scrap approach outlined by the World Steel Association.

Table 2. End-of-life scenario for the steel pipes and retention tanks manufactured by ViaCon AB

Material	Material recovery	Recycling	Landfilling
Steel scrap	100%	95%	5%

Life cycle assessment information

Declared Unit

The declared unit is 1 ton of galvanized or painted HelCor® pipes and ViaCon Stormwater Solutions 300mm diameter to 3600mm diameter, 1.5mm up to 3.5mm gauge manufactured by ViaCon AB.

Allocation

The allocation is made in accordance with the provisions of EN 15804. Incoming energy and water and waste production in-house is allocated equally among products through mass allocation. Effects of primary production of recycled materials is allocated to the main product in which the material was used. The recycling process and transportation of the material is allocated to this analysis.

System boundary

The life cycle analysis (LCA) of the declared products covers product stage – modules A1-A3, end of life – modules C1-C4 and benefits and loads beyond the system boundary – module D (cradle-to- gate with options) in accordance with EN 15804+A2. Energy and water consumption, emissions as well as information on generated wastes were inventoried and were included in the calculations. It can be assumed that the total sum of omitted processes does not exceed 5% of all impact categories. In accordance with EN 15804+A2, machines and facilities (capital goods) required for the production as well as transportation of employees were not included in LCA.

Data collection period

Primary data provided by ViaCon AB covers a period from 01.01.2024 to 31.12.2024 (1 year). The life cycle assessments were prepared for Sweden and Europe as reference area.

Data quality

For foreground data, the LCA study relies on high-quality primary data gathered by ViaCon for the year 2024, including all materials used and average transport distances for material supplies. All relevant background data sets have been sourced from the OpenLCA software's database: Ecoinvent 3.9.1, which includes consistent and well-documented data sets accessible in the Ecoinvent online database or through the Ecoinvent database documentation. No specific data collected is older than five years and no generic datasets

used are older than ten years. The representativeness, completeness, reliability, and consistency are judged as good.

Assumptions and estimates

The environmental impacts of representative steel pipes and retention tanks manufactured by ViaCon AB were aggregated using weighted averages, based on the total annual production volumes. Impacts were inventoried and calculated for all steel pipes and retention tanks produced within the specified data collection period.

For certain life cycle stages and processes, where primary data were unavailable, reasonable assumptions and secondary data were applied in accordance with EN 15804+A2 and industry best practices. For example, average transport distances for material supplies and waste management were estimated using company records and regional logistics data. The energy consumption and emissions for manufacturing and end-of-life processes were based on site-specific primary data where available and complemented by generic datasets from the Ecoinvent 3.9.1 database for background processes.

In the end-of-life stage (modules C1–C4), the deconstruction and transport of dismantled products were modeled using typical scenarios and literature values for steel infrastructure, assuming a 70 km average transport distance to waste processing facilities. The recycling scenario assumes a 95% recycling rate and 5% landfill for steel scrap, in line with sectoral statistics and the net scrap approach recommended by the World Steel Association.

The total contribution of omitted processes is estimated not to exceed 5% of the overall impacts for any category. No significant data gaps were identified, and all estimates are conservative and representative for the declared products and reference area.

Calculation rules

LCA was performed using OpenLCA software developed in accordance with EN 15804+A2.

Geographic representativeness

The specified land or region where the product system is manufactured and managed is Sweden, Europe.

Life cycle assessment (LCA) – Results

Table 3 System boundaries for the environmental characteristic of the product.

Environmental assessment information (MD – Module Declared, MND – Module Not Declared, INA – Indicator Not Assessed)																
Product stage			Construction process		Use stage							End of life				Benefits and loads beyond the system boundary
Raw material supply	Transport	Manufacturing	Transport to construction site	Construction-installation process	Use	Maintenance	Repair	Replacement	Refurbishment	Operational energy use	Operational water use	Deconstruction demolition	Transport	Waste processing	Disposal	Reuse-recovery-recycling potential
A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
MD	MD	MD	MND	MND	MND	MND	MND	MND	MND	MND	MND	MD	MD	MD	MD	MD

HelCor® steel pipes - galvanized

Table 4. Life cycle assessment (LCA) results of the **HelCor® galvanized steel pipes** manufactured by ViaCon AB – environmental impacts (DU: 1 ton)

Impact category	Unit	A1	A2	A3	C1	C2	C3	C4	D
Global Warming Potential (Total)	kg CO ₂ eq.	2,24E+03	1,50E+02	7,33E+01	1,17E+00	1,30E+01	3,29E+00	3,04E-01	-2,06E+03
Global Warming Potential (Fossil Fuels)	kg CO ₂ eq.	2,23E+03	1,49E+02	4,37E+01	1,05E-03	1,29E+01	3,27E+00	3,04E-01	-2,05E+03
Global Warming Potential (Biogenic)	kg CO ₂ eq.	4,81E+00	8,49E-01	2,92E+01	1,17E+00	1,19E-02	5,15E-03	1,70E-04	-4,45E+00
Global Warming Potential (Land Use and Land Use Change)	kg CO ₂ eq.	1,58E+00	1,65E-01	5,16E-01	1,15E-04	6,39E-03	1,03E-02	1,80E-04	-1,45E+00
Ozone Depletion Potential	kg CFC ₁₁ eq.	3,86E-05	2,77E-06	8,65E-07	2,48E-07	2,82E-07	5,52E-08	8,80E-09	-3,55E-05
Acidification Potential	mol H ⁺ eq.	9,89E+00	8,68E-01	2,90E-01	6,96E-03	2,83E-02	1,80E-02	2,29E-03	-9,10E+00
Abiotic Depletion for Fossil Resources Potential	MJ	2,43E+04	2,18E+03	1,41E+03	1,56E+01	1,85E+02	4,62E+01	7,63E+00	-2,24E+04
Abiotic Depletion Potential for Non-Fossil Resources	kg Sb _{eq.}	6,79E-03	2,50E-04	8,47E-05	5,87E-07	3,01E-05	6,63E-06	2,29E-07	-6,25E-03
Eutrophication Potential (Freshwater)	kg P eq.	1,06E+00	3,77E-02	4,38E-03	3,65E-05	9,20E-04	3,40E-04	2,53E-05	-9,74E-01
Eutrophication Potential (Marine)	kg N eq.	2,27E+00	3,13E-01	1,23E-01	2,86E-03	7,13E-03	6,94E-03	8,80E-04	-2,09E+00
Eutrophication Potential (Accumulated Exceedance)	mol N eq.	2,31E+01	3,34E+00	1,32E+00	3,14E-02	7,25E-02	7,39E-02	9,42E-03	-2,12E+01
Formation Potential of Tropospheric Ozone	kg NMVOC _{eq.}	1,07E+01	1,08E+00	4,08E-01	8,57E-03	4,39E-02	2,41E-02	3,28E-03	-9,88E+00
Water Deprivation Potential	m ³ eq.	1,02E+03	2,66E+01	3,42E+01	4,19E-02	9,19E-01	4,13E-01	2,37E-02	-9,40E+02

Table 5. Life cycle assessment (LCA) results of the HelCor® galvanized steel pipes manufactured by ViaCon AB – additional impacts indicators (DU: 1 ton)

Impact category	Unit	A1	A2	A3	C1	C2	C3	C4	D
Potential Incidence of Disease due to PM Emissions	Disease incidence	1,80E-04	1,02E-05	7,37E-06	0,00E+00	7,70E-07	2,88E-07	4,90E-08	-1,70E-04
Potential Human Exposure Efficiency Relative to U235	kBq U235 eq.	8,39E+01	1,75E+01	6,46E+01	0,00E+00	2,49E-01	5,83E-02	4,80E-03	-7,72E+01
Potential Comparative Toxic Unit for Ecosystems	CTUe	1,21E+04	9,67E+02	3,00E+02	0,00E+00	9,06E+01	3,23E+01	3,55E+00	-1,11E+04
Potential Comparative Toxic Unit for Humans (Non-Cancer)	CTUh	4,34E-05	1,23E-06	3,22E-07	0,00E+00	1,13E-07	3,18E-08	1,45E-09	-3,99E-05
Potential Soil Quality Index	dimensionless	7,41E+03	1,32E+03	3,20E+02	0,00E+00	3,51E+01	1,50E+01	-6,81E+03	0,00E+00

Table 6. Life cycle assessment (LCA) results of the HelCor® galvanized steel pipes manufactured by ViaCon AB – the resource use (DU: 1 ton)

Impact category	Unit	A1	A2	A3	C1	C2	C3	C4	D
Total use of non-renewable primary energy resources (PENRT)	MJ	2,43E+04	2,18E+03	1,41E+03	1,56E+01	1,85E+02	4,62E+01	7,63E+00	-2,24E+04
Total use of renewable primary energy resources (PERT)	MJ	2,11E+03	1,46E+02	4,00E+02	8,91E-02	2,89E+00	8,58E-01	6,41E-02	-1,94E+03
Use of nonrenewable primary energy resources used as energy carrier (PENRE)	MJ	2,43E+04	2,18E+03	1,41E+03	0,00E+00	1,85E+02	4,62E+01	7,63E+00	-2,24E+04
Use of nonrenewable primary energy resources used as raw materials (PENRM)	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Use of nonrenewable secondary fuels (NRSF)	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Use of renewable primary energy resources used as energy carrier (PERE)	MJ	2,11E+03	1,46E+02	4,00E+02	0,00E+00	2,89E+00	8,58E-01	6,41E-02	-1,94E+03
Use of renewable primary energy resources used as raw materials (PERM)	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Use of renewable secondary fuels (RSF)	MJ	0,00E+00	0,00E+00	0,00E+00	1,99E-05	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Use of secondary materials (SM)	kg	0,00E+00	0,00E+00	5,00E+01	6,10E-03	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Use of net fresh water (FW)	m3	2,99E+01	9,11E-01	8,40E-01	9,46E-04	3,04E-02	1,32E-02	8,25E-03	-2,75E+01

Table 7. Life cycle assessment (LCA) results of the **HelCor® galvanized steel pipes** manufactured by ViaCon AB – waste categories (DU: 1 ton)

Impact category	Unit	A1	A2	A3	C1	C2	C3	C4	D
Hazardous Waste Disposed	kg	1,68E-01	1,08E-02	3,63E-03	2,09E-02	1,17E-03	2,90E-04	4,02E-05	-1,55E-01
Non-Hazardous Waste Disposed	kg	1,98E+01	1,07E-01	2,59E-02	1,47E-01	5,21E-03	1,35E-03	1,10E-04	-1,83E+01
Radioactive Waste Disposed	kg	2,09E-02	4,46E-03	1,38E-02	1,09E-04	6,04E-05	1,41E-05	1,12E-06	-1,92E-02

Table 8. Life cycle assessment (LCA) results of the **HelCor® galvanized steel pipes** manufactured by ViaCon AB – End-of-Life flows categories (DU: 1 ton)

Impact category	Unit	A1	A2	A3	C1	C2	C3	C4	D
Components for Re-Use	kg	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Materials for Recycling	kg	0,00E+00	0,00E+00	0,00E+00	2,08E-05	0,00E+00	9,50E+02	0,00E+00	0,00E+00
Materials for Energy Recovery	kg	0,00E+00	0,00E+00	0,00E+00	3,32E-07	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Exported Energy	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00

HelCor® steel pipes – Galvanized & coated

Table 9. Life cycle assessment (LCA) results of the HelCor® Galvanized & coated steel pipes manufactured by ViaCon AB – environmental impacts (DU: 1 ton)

Impact category	Unit	A1	A2	A3	C1	C2	C3	C4	D
Global Warming Potential (Total)	kg CO ₂ eq.	2,30E+03	1,56E+02	1,53E+02	1,17E+00	1,30E+01	3,29E+00	3,04E-01	-2,06E+03
Global Warming Potential (Fossil Fuels)	kg CO ₂ eq.	2,29E+03	1,55E+02	1,23E+02	1,05E-03	1,29E+01	3,27E+00	3,04E-01	-2,05E+03
Global Warming Potential (Biogenic)	kg CO ₂ eq.	5,16E+00	8,56E-01	2,92E+01	1,17E+00	1,19E-02	5,15E-03	1,70E-04	-4,45E+00
Global Warming Potential (Land Use and Land Use Change)	kg CO ₂ eq.	1,59E+00	1,68E-01	5,19E-01	1,15E-04	6,39E-03	1,03E-02	1,80E-04	-1,45E+00
Ozone Depletion Potential	kg CFC ₁₁ eq.	3,91E-05	2,89E-06	9,84E-07	2,48E-07	2,82E-07	5,52E-08	8,80E-09	-3,55E-05
Acidification Potential	mol H ⁺ eq.	1,01E+01	8,81E-01	3,15E-01	6,96E-03	2,83E-02	1,80E-02	2,29E-03	-9,10E+00
Abiotic Depletion for Fossil Resources Potential	MJ	2,66E+04	2,25E+03	1,46E+03	1,56E+01	1,85E+02	4,62E+01	7,63E+00	-2,24E+04
Abiotic Depletion Potential for Non-Fossil Resources	kg Sb _{eq.}	6,94E-03	2,60E-04	1,30E-04	5,87E-07	3,01E-05	6,63E-06	2,29E-07	-6,25E-03
Eutrophication Potential (Freshwater)	kg P eq.	1,07E+00	3,83E-02	5,44E-03	3,65E-05	9,20E-04	3,40E-04	2,53E-05	-9,73E-01
Eutrophication Potential (Marine)	kg N _{eq.}	2,30E+00	3,17E-01	1,32E-01	2,86E-03	7,13E-03	6,94E-03	8,80E-04	-2,08E+00
Eutrophication Potential (Accumulated Exceedance)	mol N _{eq.}	2,34E+01	3,37E+00	1,40E+00	3,14E-02	7,25E-02	7,39E-02	9,42E-03	-2,12E+01
Formation Potential of Tropospheric Ozone	kg NMVOC _{eq.}	1,09E+01	1,10E+00	4,36E-01	8,57E-03	4,39E-02	2,41E-02	3,28E-03	-9,87E+00
Water Deprivation Potential	m ³ eq.	1,04E+03	2,71E+01	3,80E+01	4,19E-02	9,19E-01	4,13E-01	2,37E-02	-9,39E+02

Table 10. Life cycle assessment (LCA) results of the HelCor® Galvanized & coated steel pipes manufactured by ViaCon AB – additional impacts indicators (DU: 1 ton)

Impact category	Unit	A1	A2	A3	C1	C2	C3	C4	D
Potential Incidence of Disease due to PM Emissions	Disease incidence	1,90E-04	1,04E-05	7,67E-06	0,00E+00	7,70E-07	2,88E-07	4,90E-08	-1,70E-04
Potential Human Exposure Efficiency Relative to U235	kBq U235 eq.	8,70E+01	1,77E+01	6,48E+01	0,00E+00	2,49E-01	5,83E-02	4,80E-03	-7,71E+01
Potential Comparative Toxic Unit for Ecosystems	CTUe	1,22E+04	1,01E+03	3,43E+02	0,00E+00	9,06E+01	3,23E+01	3,55E+00	-1,11E+04
Potential Comparative Toxic Unit for Humans (Non-Cancer)	CTUh	4,36E-05	1,27E-06	5,10E-07	0,00E+00	1,13E-07	3,18E-08	1,45E-09	-3,99E-05
Potential Soil Quality Index	dimensionless	7,46E+03	1,36E+03	3,52E+02	0,00E+00	3,51E+01	1,50E+01	-6,81E+03	0,00E+00

Table 11. Life cycle assessment (LCA) results of the HelCor® Galvanized & coated steel pipes manufactured by ViaCon AB – the resource use (DU: 1 ton)

Impact category	Unit	A1	A2	A3	C1	C2	C3	C4	D
Total use of non-renewable primary energy resources (PENRT)	MJ	2,66E+04	2,25E+03	1,46E+03	1,56E+01	1,85E+02	4,62E+01	7,63E+00	-2,24E+04
Total use of renewable primary energy resources (PERT)	MJ	2,15E+03	1,48E+02	9,29E+02	8,91E-02	2,89E+00	8,58E-01	6,41E-02	-1,94E+03
Use of nonrenewable primary energy resources used as energy carrier (PENRE)	MJ	2,66E+04	2,25E+03	1,46E+03	0,00E+00	1,85E+02	4,62E+01	7,63E+00	-2,24E+04
Use of nonrenewable primary energy resources used as raw materials (PENRM)	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Use of nonrenewable secondary fuels (NRSF)	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Use of renewable primary energy resources used as energy carrier (PERE)	MJ	2,15E+03	1,48E+02	9,29E+02	0,00E+00	2,89E+00	8,58E-01	6,41E-02	-1,94E+03
Use of renewable primary energy resources used as raw materials (PERM)	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Use of renewable secondary fuels (RSF)	MJ	0,00E+00	0,00E+00	0,00E+00	1,99E-05	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Use of secondary materials (SM)	kg	0,00E+00	0,00E+00	5,00E+01	6,10E-03	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Use of net fresh water (FW)	m3	3,10E+01	9,27E-01	9,01E-01	9,46E-04	3,04E-02	1,32E-02	8,25E-03	-2,74E+01

Table 12. Life cycle assessment (LCA) results of the HelCor® Galvanized & coated steel pipes manufactured by ViaCon AB – waste categories (DU: 1 ton)

Impact category	Unit	A1	A2	A3	C1	C2	C3	C4	D
Hazardous Waste Disposed	kg	1,69E-01	1,12E-02	4,29E-03	2,09E-02	1,17E-03	2,90E-04	4,02E-05	-1,55E-01
Non-Hazardous Waste Disposed	kg	1,99E+01	1,10E-01	3,44E-02	1,47E-01	5,21E-03	1,35E-03	1,10E-04	-1,82E+01
Radioactive Waste Disposed	kg	2,17E-02	4,51E-03	1,39E-02	1,09E-04	6,04E-05	1,41E-05	1,12E-06	-1,92E-02

Table 13. Life cycle assessment (LCA) results of the HelCor® Galvanized & coated steel pipes manufactured by ViaCon AB – End-of-Life flows categories (DU: 1 ton)

Impact category	Unit	A1	A2	A3	C1	C2	C3	C4	D
Components for Re-Use	kg	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Materials for Recycling	kg	0,00E+00	0,00E+00	0,00E+00	2,08E-05	0,00E+00	9,50E+02	0,00E+00	0,00E+00
Materials for Energy Recovery	kg	0,00E+00	0,00E+00	0,00E+00	3,32E-07	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Exported Energy	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00

StormWater Solutions - galvanized

Table 14 Life cycle assessment (LCA) results of the galvanized StormWater Solutions manufactured by ViaCon AB – environmental impacts (DU: 1 ton)

Impact category	Unit	A1	A2	A3	C1	C2	C3	C4	D
Global Warming Potential (Total)	kg CO ₂ eq.	2,24E+03	1,54E+02	7,33E+01	1,17E+00	1,30E+01	3,29E+00	3,04E-01	-2,06E+03
Global Warming Potential (Fossil Fuels)	kg CO ₂ eq.	2,23E+03	1,53E+02	4,37E+01	1,05E-03	1,29E+01	3,27E+00	3,04E-01	-2,05E+03
Global Warming Potential (Biogenic)	kg CO ₂ eq.	4,81E+00	8,42E-01	2,92E+01	1,17E+00	1,19E-02	5,15E-03	1,70E-04	-4,45E+00
Global Warming Potential (Land Use and Land Use Change)	kg CO ₂ eq.	1,58E+00	1,65E-01	5,16E-01	1,15E-04	6,39E-03	1,03E-02	1,80E-04	-1,45E+00
Ozone Depletion Potential	kg CFC ₁₁ eq.	3,86E-05	2,86E-06	8,65E-07	2,48E-07	2,82E-07	5,52E-08	8,80E-09	-3,55E-05
Acidification Potential	mol H ⁺ eq.	9,89E+00	8,67E-01	2,90E-01	6,96E-03	2,83E-02	1,80E-02	2,29E-03	-9,10E+00
Abiotic Depletion for Fossil Resources Potential	MJ	2,43E+04	2,23E+03	1,41E+03	1,56E+01	1,85E+02	4,62E+01	7,63E+00	-2,24E+04
Abiotic Depletion Potential for Non-Fossil Resources	kg Sb _{eq.}	6,79E-03	2,60E-04	8,47E-05	5,87E-07	3,01E-05	6,63E-06	2,29E-07	-6,25E-03
Eutrophication Potential (Freshwater)	kg P eq.	1,06E+00	3,76E-02	4,38E-03	3,65E-05	9,20E-04	3,40E-04	2,53E-05	-9,74E-01
Eutrophication Potential (Marine)	kg N _{eq.}	2,27E+00	3,12E-01	1,23E-01	2,86E-03	7,13E-03	6,94E-03	8,80E-04	-2,09E+00
Eutrophication Potential (Accumulated Exceedance)	mol N _{eq.}	2,31E+01	3,32E+00	1,32E+00	3,14E-02	7,25E-02	7,39E-02	9,42E-03	-2,12E+01
Formation Potential of Tropospheric Ozone	kg NMVOC _{eq.}	1,07E+01	1,08E+00	4,08E-01	8,57E-03	4,39E-02	2,41E-02	3,28E-03	-9,88E+00
Water Deprivation Potential	m ³ eq.	1,02E+03	2,66E+01	3,42E+01	4,19E-02	9,19E-01	4,13E-01	2,37E-02	-9,40E+02

Table 15. Life cycle assessment (LCA) results of the **galvanized StormWater Solutions** manufactured by ViaCon AB – additional impacts indicators (DU: 1 ton)

Impact category	Unit	A1	A2	A3	C1	C2	C3	C4	D
Potential Incidence of Disease due to PM Emissions	Disease incidence	1,80E-04	1,04E-05	7,37E-06	0,00E+00	7,70E-07	2,88E-07	4,90E-08	-1,70E-04
Potential Human Exposure Efficiency Relative to U235	kBq U235 eq.	8,39E+01	1,74E+01	6,46E+01	0,00E+00	2,49E-01	5,83E-02	4,80E-03	-7,72E+01
Potential Comparative Toxic Unit for Ecosystems	CTUe	1,21E+04	9,93E+02	3,00E+02	0,00E+00	9,06E+01	3,23E+01	3,55E+00	-1,11E+04
Potential Comparative Toxic Unit for Humans (Non-Cancer)	CTUh	4,34E-05	1,26E-06	3,22E-07	0,00E+00	1,13E-07	3,18E-08	1,45E-09	-3,99E-05
Potential Soil Quality Index	dimensionless	7,41E+03	1,36E+03	3,20E+02	0,00E+00	3,51E+01	1,50E+01	-6,81E+03	0,00E+00

Table 16. Life cycle assessment (LCA) results of the **galvanized StormWater Solutions** manufactured by ViaCon AB – the resource use (DU: 1 ton)

Impact category	Unit	A1	A2	A3	C1	C2	C3	C4	D
Total use of non-renewable primary energy resources (PENRT)	MJ	2,43E+04	2,23E+03	1,41E+03	1,56E+01	1,85E+02	4,62E+01	7,63E+00	-2,24E+04
Total use of renewable primary energy resources (PERT)	MJ	2,11E+03	1,45E+02	4,00E+02	8,91E-02	2,89E+00	8,58E-01	6,41E-02	-1,94E+03
Use of nonrenewable primary energy resources used as energy carrier (PENRE)	MJ	2,43E+04	2,23E+03	1,41E+03	0,00E+00	1,85E+02	4,62E+01	7,63E+00	-2,24E+04
Use of nonrenewable primary energy resources used as raw materials (PENRM)	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Use of nonrenewable secondary fuels (NRSF)	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Use of renewable primary energy resources used as energy carrier (PERE)	MJ	2,11E+03	1,45E+02	4,00E+02	0,00E+00	2,89E+00	8,58E-01	6,41E-02	-1,94E+03
Use of renewable primary energy resources used as raw materials (PERM)	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Use of renewable secondary fuels (RSF)	MJ	0,00E+00	0,00E+00	0,00E+00	1,99E-05	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Use of secondary materials (SM)	kg	0,00E+00	0,00E+00	5,00E+01	6,10E-03	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Use of net fresh water (FW)	m3	2,99E+01	9,11E-01	8,40E-01	9,46E-04	3,04E-02	1,32E-02	8,25E-03	-2,75E+01

Table 17. Life cycle assessment (LCA) results of the galvanized StormWater Solutions manufactured by ViaCon AB – waste categories (DU: 1 ton)

Impact category	Unit	A1	A2	A3	C1	C2	C3	C4	D
Hazardous Waste Disposed	kg	1,68E-01	1,11E-02	3,63E-03	2,09E-02	1,17E-03	2,90E-04	4,02E-05	-1,55E-01
Non-Hazardous Waste Disposed	kg	1,98E+01	1,08E-01	2,59E-02	1,47E-01	5,21E-03	1,35E-03	1,10E-04	-1,83E+01
Radioactive Waste Disposed	kg	2,09E-02	4,42E-03	1,38E-02	1,09E-04	6,04E-05	1,41E-05	1,12E-06	-1,92E-02

Table 18. Life cycle assessment (LCA) results of the galvanized StormWater Solutions manufactured by ViaCon AB – Eng-of-Live flows categories (DU: 1 ton)

Impact category	Unit	A1	A2	A3	C1	C2	C3	C4	D
Components for Re-Use	kg	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Materials for Recycling	kg	0,00E+00	0,00E+00	0,00E+00	2,08E-05	0,00E+00	9,50E+02	0,00E+00	0,00E+00
Materials for Energy Recovery	kg	0,00E+00	0,00E+00	0,00E+00	3,32E-07	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Exported Energy	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00

StormWater Solutions - Galvanized & coated

Table 19 Life cycle assessment (LCA) results of the Galvanized & coated StormWater Solutions manufactured by ViaCon AB – environmental impacts (DU: 1 ton)

Impact category	Unit	A1	A2	A3	C1	C2	C3	C4	D
Global Warming Potential (Total)	kg CO ₂ eq.	2,35E+03	1,59E+02	1,53E+02	1,17E+00	1,30E+01	3,27E+00	3,03E-01	-2,05E+03
Global Warming Potential (Fossil Fuels)	kg CO ₂ eq.	2,34E+03	1,58E+02	1,23E+02	1,05E-03	1,29E+01	3,25E+00	3,03E-01	-2,04E+03
Global Warming Potential (Biogenic)	kg CO ₂ eq.	5,44E+00	8,43E-01	2,92E+01	1,17E+00	1,19E-02	5,12E-03	1,70E-04	-4,43E+00
Global Warming Potential (Land Use and Land Use Change)	kg CO ₂ eq.	1,64E+00	1,68E-01	5,19E-01	1,15E-04	6,39E-03	1,02E-02	1,80E-04	-1,44E+00
Ozone Depletion Potential	kg CFC ₁₁ eq.	4,04E-05	2,96E-06	9,84E-07	2,48E-07	2,82E-07	5,48E-08	8,77E-09	-3,53E-05
Acidification Potential	mol H ⁺ eq.	1,03E+01	8,75E-01	3,15E-01	6,96E-03	2,83E-02	1,79E-02	2,28E-03	-9,05E+00
Abiotic Depletion for Fossil Resources Potential	MJ	2,71E+04	2,30E+03	1,46E+03	1,56E+01	1,85E+02	4,59E+01	7,61E+00	-2,23E+04
Abiotic Depletion Potential for Non-Fossil Resources	kg S _{beq.}	7,84E-03	2,70E-04	1,30E-04	5,87E-07	3,01E-05	6,59E-06	2,28E-07	-6,21E-03
Eutrophication Potential (Freshwater)	kg P eq.	1,08E+00	3,79E-02	5,44E-03	3,65E-05	9,20E-04	3,40E-04	2,52E-05	-9,68E-01
Eutrophication Potential (Marine)	kg N _{eq.}	2,35E+00	3,13E-01	1,32E-01	2,86E-03	7,13E-03	6,90E-03	8,80E-04	-2,07E+00
Eutrophication Potential (Accumulated Exceedance)	mol N _{eq.}	2,39E+01	3,33E+00	1,40E+00	3,14E-02	7,25E-02	7,34E-02	9,39E-03	-2,11E+01
Formation Potential of Tropospheric Ozone	kg NMVOC _{eq.}	1,13E+01	1,09E+00	4,36E-01	8,57E-03	4,39E-02	2,40E-02	3,27E-03	-9,81E+00
Water Deprivation Potential	m ³ eq.	1,06E+03	2,69E+01	3,80E+01	4,19E-02	9,19E-01	4,10E-01	2,37E-02	-9,34E+02

Table 20. Life cycle assessment (LCA) results of the Galvanized & coated StormWater Solutions manufactured by ViaCon AB – additional impacts indicators (DU: 1 ton)

Impact category	Unit	A1	A2	A3	C1	C2	C3	C4	D
Potential Incidence of Disease due to PM Emissions	Disease incidence	1,90E-04	1,06E-05	7,67E-06	0,00E+00	7,70E-07	2,86E-07	4,89E-08	-1,70E-04
Potential Human Exposure Efficiency Relative to U235	kBq U235 eq.	8,94E+01	1,75E+01	6,48E+01	0,00E+00	2,49E-01	5,79E-02	4,78E-03	-7,67E+01
Potential Comparative Toxic Unit for Ecosystems	CTUe	1,25E+04	1,03E+03	3,43E+02	0,00E+00	9,06E+01	3,21E+01	3,54E+00	-1,10E+04
Potential Comparative Toxic Unit for Humans (Non-Cancer)	CTUh	4,37E-05	1,30E-06	5,10E-07	0,00E+00	1,13E-07	3,16E-08	1,44E-09	-3,96E-05
Potential Soil Quality Index	dimensionless	7,64E+03	1,38E+03	3,52E+02	0,00E+00	3,48E+01	1,50E+01	-6,77E+03	0,00E+00

Table 21. Life cycle assessment (LCA) results of the Galvanized & coated StormWater Solutions manufactured by ViaCon AB – the resource use (DU: 1 ton)

Impact category	Unit	A1	A2	A3	C1	C2	C3	C4	D
Total use of non-renewable primary energy resources (PENRT)	MJ	2,72E+04	2,30E+03	1,46E+03	1,56E+01	1,85E+02	4,59E+01	7,61E+00	-2,23E+04
Total use of renewable primary energy resources (PERT)	MJ	2,19E+03	1,46E+02	9,29E+02	8,91E-02	2,89E+00	8,53E-01	6,39E-02	-1,93E+03
Use of nonrenewable primary energy resources used as energy carrier (PENRE)	MJ	2,72E+04	2,30E+03	1,46E+03	0,00E+00	1,85E+02	4,59E+01	7,61E+00	-2,23E+04
Use of nonrenewable primary energy resources used as raw materials (PENRM)	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Use of nonrenewable secondary fuels (NRSF)	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Use of renewable primary energy resources used as energy carrier (PERE)	MJ	2,15E+03	1,46E+02	9,29E+02	0,00E+00	2,89E+00	8,53E-01	6,39E-02	-1,93E+03
Use of renewable primary energy resources used as raw materials (PERM)	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Use of renewable secondary fuels (RSF)	MJ	0,00E+00	0,00E+00	0,00E+00	1,99E-05	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Use of secondary materials (SM)	kg	0,00E+00	0,00E+00	5,00E+01	6,10E-03	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Use of net fresh water (FW)	m3	3,17E+01	9,22E-01	9,01E-01	9,46E-04	3,04E-02	1,31E-02	8,23E-03	-2,73E+01

Table 22. Life cycle assessment (LCA) results of the Galvanized & coated StormWater Solutions manufactured by ViaCon AB – waste categories (DU: 1 ton)

Impact category	Unit	A1	A2	A3	C1	C2	C3	C4	D
Hazardous Waste Disposed	kg	5,02E-01	1,16E-02	4,29E-03	2,09E-02	1,17E-03	2,80E-04	4,01E-05	-1,54E-01
Non-Hazardous Waste Disposed	kg	2,03E+01	1,10E-01	3,44E-02	1,47E-01	5,21E-03	1,34E-03	1,10E-04	-1,81E+01
Radioactive Waste Disposed	kg	2,23E-02	4,44E-03	1,39E-02	1,09E-04	6,04E-05	1,40E-05	1,12E-06	-1,91E-02

Table 18. Life cycle assessment (LCA) results of the Galvanized & coated StormWater Solutions manufactured by ViaCon AB – Eng-of-Live flows categories (DU: 1 ton)

Impact category	Unit	A1	A2	A3	C1	C2	C3	C4	D
Components for Re-Use	kg	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Materials for Recycling	kg	0,00E+00	0,00E+00	0,00E+00	2,08E-05	0,00E+00	9,44E+02	0,00E+00	0,00E+00
Materials for Energy Recovery	kg	0,00E+00	0,00E+00	0,00E+00	3,32E-07	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Exported Energy	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00

Verification

The external verification procedure for this Environmental Product Declaration (EPD) has been carried out in accordance with the requirements of ISO 14025 standards. Once the verification process is complete, the EPD remains valid for a period of 5 years. There is no need to recalculate the parameters contained in the EPD after this period, provided that the data underlying the declaration have not changed substantially.

EPD Contributors

Manufacturer representative:	Tony Larsson, Production Manager
Manufacturer representative:	Craig Lee (Internal verifier)
EPD External verifier:	Izabela Sztamberek Sochan, Ph.D.
Note: The sole ownership, liability, and liability of this declaration are with the owner. Construction product declarations may not be comparable if they do not comply with EN 15804. For detailed information on comparability, please refer to EN 15804 and ISO 14025.	

Normative references

- EN 15804:2012+A2:2019 Sustainability of construction works – Environmental product declarations – Core rules for the product category of construction products
- ISO 14025:2006, Environmental labels and declarations – Type III environmental declarations Principles and procedures
- ISO 21930:2017 Sustainability in buildings and civil engineering works – Core rules for environmental product declarations of construction products and services
- ISO 14044:2006 Environmental management – Life cycle assessment – Requirements and guidelines
- ISO 15686-1:2011 Buildings and constructed assets – Service life planning – Part 1: General principles and framework
- ISO 15686-8:2008 Buildings and constructed assets – Service life planning – Part 8: Reference service life and service-life estimation
- EN 15942:2012 Sustainability of construction works – Environmental product declarations - Communication format business-to-business
- ISO 20915:2018 Life cycle inventory calculation methodology for steel products
- EN 1090-1: Execution of steel structures and aluminum structures - Part 1: Requirements for conformity assessment of structural components. World Steel Association (2017). Life Cycle Inventory Methodology Report for Steel Products, Brussels, Belgium.
- World Steel Association (2022). Life Cycle Inventory Study Report – 2021 Data Release, Brussels, Belgium.
- Multicert Sp. z o.o. (2024). General Programme Instructions of the EPD Poland Programme, Warsaw, Poland.

CERTIFICATE

EPD TYPE III DECLARATION

(ENVIRONMENTAL PRODUCT DECLARATION)

This document confirms that the Environmental Product Declaration developed by

ViaCon AB Sweden for Steel HelCor® pipes and
ViaCon Stormwater Solutions

manufactured in accordance with standards

EN 13859-1, EN 13859-2,

meets the requirements of standards

EN 15804 + A2 and ISO 14025,

and that the data contained therein has been prepared correctly.



Verification carried out by:


Izabela Sztamberek Sochan, Ph.D.



Program Manager


Grzegorz Suwara

This document is valid until June 12, 2030, or until EPD is deregistered and its publication on the website www.epd.org.pl is discontinued.

EPD Polska Registration Office,
Warsaw, June 12, 2025

www.epd.com.pl